

## **JOHN C. HULL**

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### **Education**

B.A. and M.A., Mathematics, Cambridge University, England 1965-68.

M.A., Operational Research, Lancaster University, England, 1969.

Ph.D., Finance, Faculty of Management, Cranfield University, England, 1973-76.

### **Employment History**

2000 to Present: Maple Financial Professor of Derivatives and Risk Management, Joseph L. Rotman School of Management, University of Toronto, Toronto, Ontario, Canada.

1990 to 2000: Professor of Finance, Joseph L. Rotman School of Management, University of Toronto, Toronto, Ontario, Canada.

1988 to 1990: Associate Professor of Finance, Joseph L. Rotman School of Management, University of Toronto, Toronto, Ontario, Canada.

1981-1988: Associate Professor of Finance, Faculty of Administrative Studies, York University, Downsview, Ontario, Canada.

1978-1981: Senior Lecturer in Finance and Accounting, Cranfield School of Management, Cranfield University, England.

1976-1978: Lecturer in Finance and Accounting, Cranfield School of Management, Cranfield University, England.

1973-1976: Lecturer, Quantitative Aspects of Management, Cranfield School of Management, Cranfield University, England.

1971-1972: Senior Research Officer, London Graduate School of Business Studies, London, England.

1969-1971: Corporate Planning Officer, British Shoe Corporation, Leicester, England.

### **Visiting Appointments**

Fall 2000: Visiting Professor, Finance, Stern School of Business, New York University

1980-1981: Visiting Assistant Professor, Finance and Accounting, Faculty of Commerce and Business Administration, University of British Columbia, Canada

1978-1979: Visiting Assistant Professor, Finance and Accounting, Faculty of Commerce and Business Administration, University of British Columbia, Canada.

Fall 1977: Visitor on Individual Studies Program at Harvard Business School.

## Honours and Awards

- 2018: Appointed Senior Research Fellow, Global Risk Institute
- 2016: Appointed to Advisory Council of Global Risk Institute in Financial Services
- 2016: Awarded title "University Professor" at University of Toronto. (This prestigious title is awarded to only about 2% of the tenured faculty at the university.)
- 2016: Elected to Fields Institute Fellowship
- 2013: Winner of Harry M. Markowitz award for best paper published in *Journal of Investment Management* in 2013. The paper is entitled "LIBOR vs. OIS: The Derivatives Discounting Dilemma" (with Alan White)
- 2013: Voted winner of award for outstanding contribution to the RiskMinds at the 20<sup>th</sup> annual RiskMinds conference in Amsterdam.
- 2013: Voted winner of the title of Canadian Risk Manager of the Year by the Toronto chapter of the Professional Risk Managers' International Association (PRMIA)
- 2012: Gave the convocation address to graduating students and their families at the Joseph L. Rotman School of Management, University of Toronto
- 2011: Graham and Dodd Scroll Award by Financial Analysts Journal for paper entitled "The Risk of Tranches Created from Mortgages" (with Alan White)
- 2011: Harry M. Markowitz Special Distinction Award by *Journal of Investment Management* for paper entitled "An Improved Implied Copula Model and Its Application to the Valuation of Bespoke CDO Tranches." (with Alan White)
- 2010: Life-time achievement award, Risk Magazine
- 2010: Winner of Higher Standard Award by the Professional Risk Managers' International Association (PRMIA)
- 2009: Elected to Fixed Income Hall of Fame by the Fixed Income Analysts Society (FIASI)
- 2008: Inaugural recipient of the Professional Risk Managers' International Association (PRMIA) History Makers Award.
- 2006: In an industry survey by the International Centre for Business Information (ICBI), voted the academic who has made the most contribution to the derivatives industry over the previous five years.
- 2002: Included by the magazine Risk in its Hall of Fame as one of the 50 people who have "made a profound contribution to the field of risk management"
- 2002: Winner of the Northrop Frye Award at University of Toronto for linking teaching and research.
- 2001: Appointed Chairman of the Moody's Academic Advisory and Research Committee
- 2000: Appointed Maple Financial Group Professor of Derivatives and Risk Management at the Joseph L. Rotman School of Management
- 1999: Financial Engineer of the Year, awarded by the International Association of Financial Engineers.
- 1999: Won Roger Martin and Nancy Lang award for excellence in teaching
- 1999: Won award for best second year MBA teacher, University of Toronto
- 1997: My book *Options, Futures, and Other Derivatives* was referenced (along with three publications of Black, Scholes, and Merton) by The Royal Swedish Academy of Sciences in the press release on October 14, 1997 announcing that Robert Merton and Myron Scholes had won Nobel Prize for Economic Sciences.

- 1996: Won outstanding teacher award at University of Toronto.
- 1989: Won with Alan White the Nikko-LOR Research Competition with a paper entitled "One factor interest-rate models and the valuation of interest-rate derivative securities."
- 1989: Won Graduate Student Business Council Award presented for outstanding service by a faculty member to the students of the Faculty of Management
- 1987: Won with Alan White second prize in the Practical/Professional section of the Montreal Exchange's IOM Award Competition for a paper entitled "Hedging through the cap : implications for market efficiency, hedging and option pricing."
- 1985: Won with Alan White first prize in the Practical/Professional section of the Montreal Exchange's 1984-85 IOM Awards Competition for a paper entitled "The Use of Exchange-traded Currency Options to Hedge the Risks from writing Non-Exchange-Traded Currency Options."
- 1984: Won with Nahum Biger first prize in the Practical/Professional section of the Montreal Exchange's 1983-84 IOM Awards Competition for a paper entitled, "The Valuation of Currency Options."
- 1965-68: Won a total of three prizes and a scholarship at Cambridge University. Obtained first class honors in all three years. Graduated as Wrangler.

### **Journal Appointments**

- Associate Editor, Journal of Financial and Quantitative Analysis, 1991 to 1999.
- Associate Editor, Journal of Derivatives, 1993 to present.
- Associate Editor, Applied Mathematical Finance, 1993 to 2002.
- Associate Editor, Review of Derivatives Research, 1993 to 2010.
- Associate Editor, Journal of Financial Engineering, 1994 to 1998, and 2013 to present
- Associate Editor, Journal of Derivatives and Hedge Funds (Formerly Journal of Derivatives Use, Trading & Regulation), 1994 to 2014
- Associate Editor, Canadian Journal of Administrative Studies, 1996 to 2011.
- Associate Editor, Journal of Risk, 1998 to present
- Associate Editor, Journal of Bond Trading and Management, 2001 to present.
- Associate Editor, Journal of Credit Risk, 2004 to present
- Associate Editor, Journal of Derivatives Accounting, 2002 to 2005 (chair, supervisory academic committee)
- Associate Editor, Journal of Risk Management in Financial Institutions, 2007 to present
- Associate Editor, International Journal of Portfolio Management, 2011 to present
- Associate Editor, Journal of Asset Management, 2014 to present

### **Books Authored**

“Options, Futures, and Other Derivatives,” Pearson, New York, USA: first edition 1988; second edition; 1992; third edition 1996, fourth edition 1999, fifth edition 2002, sixth edition 2005, seventh edition 2008, eighth edition 2011, ninth edition 2014, tenth edition 2017 (includes instructor's manual, student solution’s manual, slides, and software;

translated into many languages including German, French, Italian, Russian, Korean, Japanese, Mandarin, Cantonese, Spanish, and Portuguese.

“Fundamentals of Futures and Options Markets,” Pearson, New York, USA: first edition 1991; second edition, 1995; third edition 1998; fourth edition 2001, fifth edition 2004, sixth edition, 2007, seventh edition 2010, eighth edition 2013, ninth edition 2016 (includes instructors' manual, student solution's manual and study guide, slides, and software; translated into many languages including German, French, Italian, Polish, Korean, Japanese, Mandarin, Cantonese, Spanish, Portuguese, and Singaporean.

“Risk Management and Financial Institutions,” John Wiley and Sons, Hoboken, New Jersey USA. (first two editions published by Pearson): first edition 2006, second edition 2009, third edition 2012, fourth edition 2015, fifth edition 2018 (includes instructor's manual, slides and software); translated into several languages including French, Polish, Japanese, Italian, Mandarin, Macedonian, Albanian.

“Hull-White on Derivatives,” Risk Books, 1996 (with Alan White)

“The Evaluation of Risk in Business Investment,” Pergamon Press, 1980.

“Model Building Techniques for Management,” Saxon House, 1976 (with J. Mapes and B. Wheeler)

### **Articles in Refereed Journals and Books, and Other Invited Articles**

“Interest Rate Trees: Extensions and Applications” *Quantitative Finance*, forthcoming (with Alan White)

“Optimal Delta Hedging for Options” *Journal of Banking and Finance*, 82, September 2017, 180-190. (with Alan White)

“XVAs: A Gap Between Theory and Practice” *Risk*, 29, 5 (May 2016): 50-52. (with Alan White)

“Multicurve Modeling with Trees” In *Innovations in Derivatives Markets*, edited by Kathrin Glau, Zorana Grbac, Matthias Scherer, and Rudi Zagst, Springer Proceedings in Mathematics and Statistics, 2016: 171-189 (with Alan White).

“How Are the New Rules for OTC Derivatives Working?” Invited editorial, *Journal of Risk Management and Financial Institutions*, Autumn/Fall 2015

“Short Rate Joint Measure Models”, *Risk*, October 2014, 59-63 (with Alexander Sokol and Alan White)

“A Generalized Procedure for Building Trees for the Short Rate and its Application to Determining Market Implied Volatility Functions,” *Quantitative Finance*, Vol. 15, No. 3 (2015), 443-454. (with Alan White)

“Collateral and Credit Issues in Derivatives Pricing,” *Journal of Credit Risk*, Vol. 10, No. 3 (2014): 3-28 (with Alan White)

“The Changing Landscape for Derivatives,” *Journal of Financial Engineering*, Vol. 1, No. 3 (Sept. 2014): 1-8.

“OIS Discounting, Interest Rate Derivatives, and the Modeling of Stochastic Interest Rate Spreads,” *Journal Of Investment Management*, Vol. 13, No. 1 (2015): 64-83 (with Alan White).

“The Valuation of Market-Leveraged Stock Units,” *Journal of Derivatives*, Vol. 21, No. 3 (Spring 2014), 85-90 (with Alan White).

“Valuing Derivatives: Funding Value Adjustments and Fair Value” *Financial Analysts Journal*, Vol. 70, No. 3 (2014): 46-56 (with Alan White).

“ Should a Derivatives Dealer Make a Funding Value Adjustment,” Chapter 10 in *Counterparty Credit Risk* edited by Eduardo Canabarro and Michael Pykhtin, Risk Books, (with Alan White)

“LIBOR vs. OIS: The Derivatives Discounting Dilemma” *Journal of Investment Management*, Vol 11, No. 3 (2013) 14-27 (with Alan White). Winner of Harry M. Markowitz Award.

“CCPs: Their Risks and How They Can Be Reduced,” *Journal of Derivatives*, Vol. 20, No. 1 (Fall 2012) 26-29.

“Ratings Arbitrage and Structured Products,” *Journal of Derivatives*, Vol. 20, No.1 (Fall 2012) 80-86 (with Alan White)

“CVA and Wrong Way Risk,” *Financial Analysts Journal*, Vol. 68, No. 5 (Sept/Oct 2012) 58-69 (with Alan White)

“My Research Philosophy,” in *Eminent Economists – Their Life and Work Philosophies*, edited by Michael Szenberg and Lall Ramrattan, Cambridge University Press, 2014

“Ratings, Mortgage Securitizations, and the Apparent Creation of Value” Chapter 7 in *Rethinking the Financial System*, edited by Alan Blinder, Bob Solow, and Andrew Lo, Russell Sage Foundation/The Century Foundation, 2012 (with Alan White)

“Credit Derivatives,” Chapter 20 in *Handbook of Economics and Finance*, Volume 2B: Financial Markets and Asset Pricing, edited by George Constantinides, Milton Harris, and René Stulz, 2012, Oxford, UK: Elsevier (with Alan White)

“The Valuation of Correlation-Dependent Credit Derivatives Using a Structural Model,” *Journal of Credit Risk*, 6, 3 (Fall 2010), 99-132 (with Alan White and Mirela Predesu)

“The Risk of Tranches Created from Mortgages,” *Financial Analysts Journal*, 66, 5 (September/October 2010), 54-67 (with Alan White). Winner of Graham and Dodd Scroll Award.

“OTC Derivatives and Central Clearing: Can All Transactions Be Handled?” *Financial Stability Review*, 14 (July 2010), 71-80

“An Improved Implied Copula Model and its Application to the Valuation of Bespoke CDO Tranches,” *Journal of Investment Management*, 8, 3 (2010), 11-31 (with Alan White). Winner of Harry Markowitz Special Distinction Award.

“The Credit Crunch of 2007: What Went Wrong? Why? What Lessons can Be Learned” *Journal of Credit Risk*, 5, 2 (2009), 3-18. An early version of this paper appears as chapter 7 in the proceedings of the 2008 International Banking Conference: The First Credit Turmoil of the 21<sup>st</sup> Century” World Scientific Publishers, 2009. Republished as Chapter 1 in *Lessons from the Crisis*, Incisive Media, 2010.

“The Credit Crisis of 2007 and its Implications for Risk Management,” invited chapter in *Understanding the Financial Crisis: Investment Risk and Governance* (eds: S. Thomsen, C. Rose, and O. Risager), SimCorp Strategy Lab, 2009. Updated version published as Chapter 5 in *Global Asset Management: Strategies, Risks Processes, and Technologies*, edited by Michael Pinedo and Ingo Walter, Palgrave Macmillan, 2013.

“The Financial Crisis of 2007: Another Case of Irrational Exuberance,” invited Chapter in *The Financial Crisis and Rescue* University of Toronto Press, 2008.

“Dynamic Models of Portfolio Credit Risk: A Simplified Approach” *Journal of Derivatives*, 15, 4 (Summer 2008), 9-28 (with Alan White).

“Forwards and European Options on CDO Tranches” *Journal of Credit Risk*, 3, 2 (Summer 2007), 63-73 (with Alan White).

“Volatility Surfaces: Theory, Rules of Thumb, and Empirical Evidence,” *Quantitative Finance*, 7, 5 (October 2007), 507-524. (with Toby Daglish and Wulin Suo)

“Valuing Credit Derivatives Using an Implied Copula Approach,” *Journal of Derivatives*, 14, 2 (Winter 2006), 8-28 (with Alan White)

“Bond Prices, Default Probabilities, and Risk Premiums”, *Journal of Credit Risk*, 1, 2 (2005) 53-60. (with Mirela Predescu and Alan White)

"Merton's Model, Credit Risk, and Volatility Skews" *Journal of Credit Risk*, 1, 1 (2004), 1-27, (with Izzy Nelken and Alan White)

"The Relationship Between Credit Default Swap Spreads, Bond Yields, and Credit Rating Announcements," *Journal of Banking and Finance*, 28 (Nov 2004), 2789-2811 (with Mirela Predescu and Alan White)

"Valuation of a CDO and an  $n^{\text{th}}$  to Default CDS Without Monte Carlo Simulation," *Journal of Derivatives*, 12, 2 (Winter 2004), 8-23 (with Alan White)

"Accounting for Employee Stock Options: A Practical Approach to Handling Valuation Issues" *Journal of Derivatives Accounting*, 1, 1 (March 2004), 3-9 (with Alan White).

"How to Value Employee Stock Options," *Financial Analysts Journal*, 60, 1, (January/February 2004), 114-119. (with Alan White)

“Valuing Credit Default Swap Options" *Journal of Derivatives*, 10, 3 (Spring 2003), 40-50 (with Alan White)

“A Methodology for Assessing Model risk and its Application to the Implied Volatility Function Model.” *Journal of Financial and Quantitative Analysis*, Vol. 37, No.2 (June 2002), 297-318 (with Wulin Suo)

“The General Hull-White Model and Supercalibration” *Financial Analysts Journal*, Vol. 57, No. 6 (Nov/Dec 2001), 34-43 (with Alan White)

“The Estimation of Default Probabilities: A Review of Alternative Methodologies and Why They Give Different Results” pp171-180 in *Mastering Risk*, Volume 2, ed: Carol Alexander, 2001, Prentice Hall, (with Alan White).

“Risk-Neutral and Real-World Measures of Default Risk" in *Visions of Risk*, ed: Carol Alexander, Pearson Education, 2000. (with Alan White)

“Valuing Credit Default Swaps I: No Counterparty Default Risk” *Journal of Derivatives*, Vol. 8 No. 1 (Fall 2000), pp 29-40 (with Alan White)

“Valuing Credit Default Swaps II: Modeling Default Correlations” *Journal of Derivatives* Vol. 8 No. 3 (Spring 2001) pp12-22 (with Alan White)

“Forward Rate Volatilities, Swap Rate volatilities, and the Implementation of the LIBOR Market Model” *Journal of Fixed Income*, Vol. 10, No. 3, September 2000, pp 46-62 (with Alan White)

“Quantifying Credit Risk: Why different approaches give different answers” *Canadian Journal of Administrative Studies*, September 1999, Vol. 16, No. 3 (with Alan White; invited article)

“Incorporating Volatility Updating into the Historical Simulation Method for VaR” *The Journal of Risk*, Fall 1998, Vol 1, No 1, pp 5-19 (with Alan White). Reprinted in *Innovations in Risk Management: Seminal Papers from the Journal of Risk*, Edited by Philippe Jorion, 2004.

"Value at Risk when Daily Changes in Market Variables are not Normally Distributed" *Journal of Derivatives*, Spring, 1998, Vol 5, No3, pp 9-19 (with Alan White)

"Evaluating the Impact of Skewness and Kurtosis on Derivative Prices" *Net Exposure*, Dec 1997, pp 81-90 (with Alan White)

"A Note on the Models of Hull and White for Pricing Options on the Term Structure: Response" *Journal of Fixed Income*, Vol 5, No 2 (Sept 1995), pp 97-102 (with Alan White).

"Using Hull-White Interest Rate Trees," *Journal of Derivatives*, Vol. 3, No. 3 (Spring 1996), pp 26-36 (with Alan White).

"Numerical Procedures for Implementing Term Structure Models I: Single-Factor Models," *Journal of Derivatives*, Fall 1994, pp 7-16 (with Alan White).

"Numerical Procedures for Implementing Term Structure Models II: Two-Factor Models," *Journal of Derivatives*, Winter 1994, pp 37-48 (with Alan White).

"The Impact of Default Risk on the Prices of Options and Other Derivative Securities," *Journal of Banking and Finance*, Vol 19 (1995), pp 299-322 (with Alan White).

"Interest-Rate Options: Choosing a Model for Trading" in *Advanced Strategies in Financial Risk Management*, Chapter 3, pp 49-58 (with Alan White).

"The Pricing of Options on Interest Rate Caps and Floors Using the Hull-White Model" in *Advanced Strategies in Financial Risk Management*, Chapter 4, pp 59-67. Reprinted in *Journal of Financial Engineering*, Vol 2, No 3 (September 1993), pp 287-296 (with Alan White)

"Bond Option Pricing Based on a Model for the Evolution of Bond Prices" *Advances in Futures and Options Research*, Vol 6 (1993) pp 1-13 (with Alan White).

"Efficient Procedures for Valuing European and American Path-Dependent Options," *Journal of Derivatives*, Vol 1, No 1 (Fall 1993), pp 21-31 (with Alan White).

"One Factor Interest Rate Models and the Valuation of Interest Rate Derivative Securities," *Journal of Financial and Quantitative Analysis*, Vol 28, No 2, (June 1993) pp 235-254 (with Alan White)

"Analisi del rischio connesso al credito e indici di inadeguatezza del capitale" *Rivista di Sistemi Finanziari*, Vol 3, No.3, (1991) (with Alan White).

"Pricing Interest-Rate Derivative Securities", *The Review of Financial Studies*, Vol 3, No. 4 (1990) pp. 573-592 (reprinted in *Options: Recent Developments in Theory and Practice*, Vol 2, 1992, pp 160-180. (with Alan White). Also reprinted in *Options Markets* by George Constantinides and A. G. Malliaris and *The Debt Market* by Stephen Ross. (These are two volumes of the *Critical Writings in Financial Economics* series edited by Richard Roll)

"Contingent Claim Valuation with a Random Evolution of Interest Rates: Commentary" *The Review of Futures Markets*, Vol 9, No. 1 (1990) pp. 77-78.

"Monitoring a Company's Operating Cash Flow Using Variance Analysis", *Accounting Horizons*, Vol. 4, No. 3 (Sept. 1990), pp 50-57.

"Valuing Derivative Securities Using the Explicit Finite Difference Method" *Journal of Financial and Quantitative Analysis*, Vol. 25 No. 1 (March 1990), pp 87-99 (with Alan White).

"Assessing Credit Risk in a Financial Institution's Off-Balance Sheet Commitments" *Journal of Financial and Quantitative Analysis*, Vol. 24 No. 4 (Dec. 1989) pp 489-502.

"An Analysis of the Bias in Option Pricing Caused by a Stochastic Volatility" *Advances in Options and Futures Research*, Vol. 3, 1988, pp 29-61 (with Alan White).

"An Analysis of the Credit Risks in Interest Rate Swaps and Currency Swaps" in *Recent Developments in International Banking and Finance*, Vol III, 1989.

"The Use of the Control Variate Technique in Option Pricing", *Journal of Financial and Quantitative Analysis*, Sept. 1988, pp 237-251 (with Alan White).

"An Overview of Contingent Claims Pricing" *Canadian Journal of Administrative Sciences*, Sept. 1988, pp 55-61 (with Alan White).

"Hedging through the Cap: Implications for Market Efficiency, Hedging and Option Pricing" *International Options Journal*, Vol 4, pp 17-22, 1987 (with Alan White).

"The Management of a Bank's Off-Balance Sheet Exposures: The Case of Interest Rate Swaps" *Banking Law and Finance Review*, Vol. 2, No. 1, pp 47-60, 1987.

"The Pricing of Options on Assets with Stochastic Volatilities" *Journal of Finance*, Vol. 42, No. 2, pp. 281-300, June 1987 (with Alan White). Reprinted in "Options: Classic Approaches to Pricing and Modeling," edited by Lane Hughston.

"Hedging the Risks from Writing Foreign Currency Options" *Journal of International Money and Finance*, Vol. 6, No. 2, pp 131-152, June 1987 (with Alan White).

"A Note on the Risk-Adjusted Discount Rate Method" *Journal of Business Finance and Accounting*, Vol. 13, No. 3, pp. 445-450, 1986.

"Risk in Capital Investment Proposals: Three Viewpoints," *Managerial Finance*, Vol. 12, No. 3, pp. 12-15, 1986.

"The Use of Exchange-Traded Currency Options to Hedge the Risks from Writing Non-Exchange-Traded Currency Options", *International Options Journal*, Vol. 2, pp. 7-18, 1985 (with Alan White).

"The Effect of a Stochastic Variance on Option Pricing," *International Options Journal*, Vol. 2, pp. 39-47, 1985 (with Alan White).

"The Valuation of Currency Options - Reply," *Financial Management*, Vol. 13, 2, 1984.

"The Impact of Taxes on the Valuation of Low-Interest Household Mortgages," *Canadian Tax Journal*, Vol. 31, No. 5, pp. 797-804, 1983.

"Valuation of Currency Options," *Financial Management*, Vol. 12, 1, pp. 24-28, 1983. Reprinted in *International Options Journal*, Vol. 1, 1, pp. 5-11, 1984 (with Nahum Biger).

"The Bargaining Positions of the Parties to a Lease Agreement," *Financial Management*, Vol. 11, 3, pp. 71-79, 1982.

"Conflicts of Interest Between Shareholders and Managers," *The Investment Analyst*, Vol. 67, pp. 4-8, September 1982.

"The Impact of Stock Relief on the Attractiveness of Capital Investment Opportunities," *Accounting and Business Research*, No. 45, pp. 30-34, Winter 1981.

"Lease Evaluation in the U.K. Current Theory and Practice," *Journal of Business Finance and Accounting*, Vol. 7, 4, pp. 619-637, 1980 (with Graham Hubbard).

"The Interpretation of the Output from a Sensitivity Analysis in Investment Appraisal," *Journal of Business Finance and Accounting*, Vol. 5, 1. pp. 109-122, 1978.

"The Accuracy of the Means and Standard Deviations of Subjective Probability Distributions," *Journal of the Royal Statistical Society, A.*, Vol. 141, 1, pp. 79-85, 1978.

"Reducing the Number of Probabilistic Variables in a Risk Simulation," *Omega*, Vol. 5, 5, pp. 605-608, 1977.

"The Input to and Output from Risk Evaluation Models," *European Journal of Operational Research*, Vol. 1, 6, pp. 368-375, 1977.

"Dealing with Dependence in Risk Simulations," *Operational Research Quarterly*, Vol. 28, 1, ii, pp. 201-218, 1977.

"The Impact of Inflation on Corporate Financial Performance," *Management Decision*, Vol. 14, 1, pp. 7-16, 1976. Reprinted in *Managerial Finance*, 1977 (with Bill Alexander)

"A Note on Risk Simulation," *Omega*, Vol. 3, 3, p. 358, 1975.

"Utility and Its Measurement," *Journal of the Royal Statistical Society, A*, Vol. 136, 2, pp. 226-247, 1973 (with Peter Moore and Howard Thomas).

"The Application of Decision Analysis to a New Product Planning Decision - A Comment," *Operational Research Quarterly*, Vol. 24, 3, pp. 469-471, 1973.

### **Other Articles**

"The FVA Debate continued" *Risk*, Vol 10, October 2012, 52

"The FVA Debate" *Risk*, 25<sup>th</sup> Anniversary Issue, July 2012, 83-85

"The Power Law," *Risk*, 20, 3 (March 2007), 72-74

"VaR vs Expected Shortfall," *Risk*, 19, 12 (December 2006), 48-49

"Defining Copulas" *Risk*, 19, 10 (October 2006), 62-64.

"New layers of protection" in Mastering Risk section of Financial Times, Sept 16, 2005 (with Alan White)

"The Credit Spread Puzzle" *Journal of Financial Transformation*, 13 (April 2005), 131-134 (with Mirela Predescu and Alan White)

"Advisor's guide to risk management" co-editor, 2002.

"Approaches to managing portfolio risk" in *Advisor's guide to risk management*, pp 14-18, 2002.

"Advisor's guide to new investment opportunities" co-editor, 2001.

"Avoiding irrational exuberance" in *Advisor's guide to new investment opportunities*, pp 20-25 (with Alan White), 2001.

"Using derivatives to achieve international diversification" in *Advisor's guide to international financial research*, pp 42-47, 2000 (with Alan White)

"Advisors guide to international financial research" co-editor, 2000

"Advisors guide to financial research" co-editor, 1999

"Taking rates to the limits," *RISK* (December 1997) pp 168-169 (with Alan White)

"Pricing credit risk: Introduction" Chapter 5 in *Derivative Credit Risk*, Risk Publications, 1995 (with Alan White).

"Branching Out," *RISK* (July, 1994), pp 34-37. Reprinted as Chapter 47 in *Over the Rainbow*, Risk Publications, Nov 1995 (with AlanWhite)

"Finding the keys," *RISK* (September, 1993), pp 109-112. Reprinted as Chapter 32 in *Over the Rainbow*, Risk Publications, Nov 1995 (with Alan White)

"The price of default," *RISK* (September, 1992) pp 101-103. Reprinted in Chapter 5 of *Derivative Credit Risk*, Risk Publications, 1995 (with Alan White) . Reprinted in *Credit Technology*, September 1998, pp 23-34.

"In the common interest" *RISK* (March 1991) pp 64-68 (with Alan White).

"Buying and selling interest rate options: the new over-the-counter market" *Canadian Investment Review* Vol III, No. 2, 1991, pp 71-74 (with Alan White)

"Over-the-counter interest-rate options" *The Treasurer*, November 1991, pp 12-15 (with Alan White).

"Modern Greek," *RISK* Vol. 4 No. 1 (Dec. 1990 - Jan. 1991) pp. 65-67. Reprinted as chapter 8 in *From Black-Scholes to Black Holes* (with Alan White).

"New ways with the yield curve," *RISK* Vol. 3 No. 9 (October 1990) pp 13-17. Reprinted as chapter 15 in *From Black--Scholes to Black Holes* (with Alan White).

"Root and branch," *RISK* Vol.3 No. 8 (September 1990) pp 69-72. Reprinted as chapter 14 in *From Black-Scholes to Black Holes* (with Alan White).

"Coming to terms," *RISK*, Vol. 3 No. 1 (Dec 1989-Jan 1990) pp 21-25. Reprinted as chapter 16 in *From Black-Scholes to Black Holes* (with Alan White).

"Currency Options and the Bank," *Canadian Banker*, pp. 46-50, February 1985 (with Alan White).

"When to Opt for Vendor Mortgage Takeback", *Financial Times*, p. 28, March 8, 1982.

"Adjusting Mark-ups for Inflation," *Management Accounting*, pp. 155-156, April 1977.

"Obtaining Probability Distributions for the Evaluation of Investment Risk," *Management Accounting*, pp. 349-351, October 1976.

"Evaluating Investment Risk," *Management Accounting*, pp. 138-141, April 1976.

"Financial Planning: Terminal Case", *Management Today*, pp. 37-47, December 1973 (with Brian Wheeler).

### **Working Papers**

"Funding Long Shots" (with Andrew Lo and Roger Stein)

"A Deep Learning Approach to Understanding Implied Volatility Movements" (with Jay Cao and Jacky Chen, in progress)

### **Current Research Interests**

Risk management, derivatives, the regulation of financial institutions, the applications of machine learning in finance

### **PhD Students Supervised**

Louis Gagnon, graduated 1990

Jason Wei, graduated 1992

Ken Vetzal graduated 1992

Wulin Suo, graduated 2002

Mirela Predescu, graduated 2006

### **Recent Appointments**

Member of Rotman Financial Services Advisory Board, 2010 to present

Co-director of Rotman's Master of Finance program (2007 to present)

Co-director of Rotman's new Master of Financial Risk Management program (2014 to present)

Member of subcommittee of Bank for International Settlements on costs of regulatory changes, 2013

Chairman, Moody's Academic and Advisory Research Committee (2001-2010)

Member, Oversight Committee, Global Risk Institute in Financial Services (2010-2012)

Appointed to the Advisory Council of the Global Risk Institute in Financial Services, 2016

Appointed Senior Research Fellow, Global Risk Institute in Financial Services

Director, FinHub (Financial Innovation Hub in Advanced Analytics), 2017 to present

### **Presentations**

Between 10 and 15 presentations per year to academic and academic/practitioner groups throughout the world

### **Other Activities**

Organization of conferences in risk management and derivatives

Co-chair of committee organizing two-day conference titled "Are We Ready for the Next Financial Crisis" in March 2018

Executive education in derivatives and risk management for banks and other organizations throughout the world.

Miscellaneous consulting and litigation support activities in North America and Europe.